CONTRACT TECHNICAL REQUIREMENT
DATE: JANUARY 11, 2000

INCH-POUND
MIL-P-44234A *
30 June 1989
SUPERSEDING
MIL-P-44234
30 June 1986

MILITARY SPECIFICATION

POTATOES, DICED, IN SAUCE, THERMOSTABILIZED, TRAY PACK

This specification is approved for use be all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document covers diced potatoes in sauce, thermostabilized in tray pack cans or polymeric trays for use by the Department of Defense as a component of operational rations.

1.2 Classification. The packaging shall be of the following styles as specified (see 6.1):

Style a - Tray Pack Can
Style b - Polymeric Tray

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.1).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5018 by using the Standardization Document Improvement Proposal (DD Form 1426 appearing at the end of this document or by letter.

SPECIFICATIONS

FEDERAL

MILITARY

MIL-L-1497 - Labeling of Metal Cans for Subsistence Items

DSCP FORM 3507 - Loads, Unit: Preparation of Semiperishable Subsistence Items

MIL-C-44340 - Can, Tray Pack

MIL-PRF-32004 - Packaging of Food in Polymeric Trays

STANDARDS

MILITARY

MIL-STD-900 - Bacterial Standards for Starches, Flours, Cereals, Alimentary Pastes, Dry Milks, and Sugars Used in the Preparation of Thermostabilized Foods for the Armed Forces

(Copies of specifications, standards, and handbooks required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity).

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

DEFENSE SUPPLY CENTER PHILADELPHIA (DSCP)

DSCP FORM 3556 - Marking Instructions for Shipping Cases, Sacks and Palletized/Containerized Loads of Perishable and Semiperishable Subsistence
DSCP FORM 3507, Loads Unit: Preparation of Semiperishable Subsistence Items
(Copies are available from the commander, Defense Supply Center Philadelphia, ATTN: DSCP-HSL, 700 Robbins Avenue, Bldg 6, Philadelphia, Pa 19111-5092)

ENVIRONMENTAL PROTECTION AGENCY (EPA)

National Primary Drinking Water Regulations

(Copies are available from the Office of Drinking Water, Environmental Protection Agency, WH550D, 401 M Street, S.W., Washington, DC 20460).

U.S. DEPARTMENT OF AGRICULTURE (USDA)

U.S. Standards for Condition of Food Containers

U.S. Standards of Identity for Margarine

(Copies are available from the Chairman, Condition of Container Committee, Agricultural Marketing Service, U.S. Department of Agriculture, Room 2506, South Building, P.O. Box 96456, Washington, DC 20090-6456).

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS), U.S. FOOD AND DRUG ADMINISTRATION (FDA)

Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder (21 CFR Parts 1-199)

(Copies are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001).

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ANSI/ASQC Z1.4 - 1993 Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the ASCQ, 611 East Wisconsin Avenue, Milwaukee, WI 53201-3005)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.1).

AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC)

Approved Methods of the American Association of Cereal Chemists

(Application for copies should be addressed to the American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121).

AOAC INTERNATIONAL

Official Methods of Analysis of the AOAC

(Application for copies should be addressed to the AOAC International, 2200 Wilson Boulevard, Suite 400-CD, Arlington, VA 2220-3301).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 1974 - Methods of Closing, Sealing and Reinforcing Fiberboard Shipping Containers

D 5118 - Fabrication of Fiberboard Shipping Boxes

D 3330 - Peel Adhesion of Pressure-Sensitive Tape

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pa 19428-2959)

NATIONAL ACADEMY OF SCIENCES

Food Chemicals Codex

(Application for copies should be addressed to the National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418).

AMERICAN SOCIETY FOR QUALITY CONTROL (ASQC)

ANSI/ASQC Z1.4 - 1993 Sampling Procedures and Tables for Inspection by Attributes

(Application for copies should be addressed to the ASCQ, 611 East Wisconsin Avenue, Milwaukee, WI 53201-3005)

(Non-Government standards and other publications are normally available from the organizations that prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services).

2.3 Order of precedence. In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article. When specified (see 6.1), a sample shall be subjected to first article inspection (see 6.2) in accordance with 4.4.

3.2 Ingredients. All ingredients shall be clean, sound, wholesome, and free from foreign material, evidence of rodent or insect infestation, extraneous material, off-odors, off-flavors, and off-colors.

3.2.1 Potatoes. Potatoes may be either fresh or dehydrofrozen.

3.2.1.1 Potatoes, fresh. Potatoes shall be fresh, clean, sound, and of a white flesh variety suitable for canning. The maximum specific gravity for the potatoes shall be 1.075 with a reducing sugar content of not more than 2.0 percent on a dry weight basis.

3.2.1.2 Potatoes, diced, dehydrofrozen. The diced dehydrofrozen potatoes shall have been prepared from fresh potatoes meeting the requirements of 3.2.1.1 and shall be diced as specified in 3.3.1.1.

3.2.2 Margarine. Margarine shall be of vegetable origin only and shall conform to the FDA Standards of Identity for Margarine (21 CFR 166.110) and shall possess a fine and pleasing flavor. The body shall be smooth, firm, and homogenous. The margarine shall possess a uniform medium yellow color and may be salted or unsalted.

3.2.3 Starch, waxy maize, modified. Starch shall be white, odorless, finely pulverized, modified waxy maize food starch for use in thermostabilized foods. The modified starch shall demonstrate initial viscosity development in the temperature range of 140^0F to 170^0F and be fully hydrated at common retort temperatures. The starch shall resist breakdown at low pH, under shear stress and conditions of cold storage. The starch shall be bland with essentially no cereal or starch taste.
3.2.4 Sugar, white, granulated. Sugar shall be white, refined, granulated cane or beet sugar, or a combination thereof, and shall comply with MIL-STD-900.

3.2.5 Salt. Salt shall be non-iodized, white, refined sodium chloride with or without anti-caking agents and shall comply with purity standards for sodium chloride of the Food Chemicals Codex.

3.2.6 Lecithin. Lecithin shall comply with the Food Chemicals Codex.

3.2.7 Calcium chloride. Calcium chloride shall comply with the Food Chemical Codex.

3.2.8 Calcium disodium EDTA. Calcium disodium EDTA shall comply with the Food Chemicals Codex.

3.2.9 Water. Water used for ice making, formulation, blanching, washing, and processing shall conform to the National Interim Primary Drinking Water Regulations.

3.2.10 Flavoring, butter, natural. The butter flavor shall be a natural flavor enhancer providing typical real butter flavor and aroma notes. The butter flavor shall impart a clean suitable flavor with no perfumy or butyric acid flavors (see 6.4).

3.2.11 Pepper, white, ground. Ground white pepper shall be derived from the dried mature berries of Piper nigrum L. from which the outer covering or the outer and inner covering have been removed. The ground pepper shall have a characteristic, penetrating odor, a hot, biting, pungent flavor and a light color. The ground white pepper shall contain not less than 1.0 ml of volatile oil per 100 grams of ground white pepper and be of such size that not less than 95 percent shall pass through a U.S. Standard No. 40 sieve.

3.2.12 Celery seed, ground. Ground celery seed shall be derived from the seed of Apium graveolens L. and shall be light to rich-brown in color, and shall possess a characteristic celery odor and flavor with a warm, slightly bitter aftertaste. The ground celery seed shall contain not less than 2.0 ml of volatile oil per 100 grams and shall be of such size that not less than 95 percent, by weight, shall pass through a U.S. Standard No. 35 sieve.

3.2.13 Preblended spice and seasoning mixture. Preblended spices and seasoning may be used. The spices and seasonings in the mixture shall comply with the requirements of this document. The containers used for the spice and seasoning blend shall be labeled with each ingredient and the percentage of each ingredient in the blend. The ingredients shall be in the same proportions as specified in the ingredient formulation.

3.2.14 Starch, waxy maize, modified (filling & processing aid). Starch shall be a white to off-white, odorless, finely pulverized powder suitable for use as a filling and processing aid in thermostabilized foods. When hydrated at temperatures of 165^0F to 200^0F, the starch shall develop a paste. The initial viscosity of the paste shall be retained under conditions of moderate shear and prolonged holding times. During retorting at temperatures in excess of 200^0F, the starch shall undergo extensive to complete breakdown of the initial viscosity. The starch shall be bland and shall demonstrate easy dispersibility (see 6.5).

3.3 Preparation and processing. Processing shall be on a continuous basis.

3.3.1 Potato preparation.

3.3.1.1 Fresh potato preparation. The clean fresh potatoes shall be peeled, trimmed, and mechanically diced with dicer settings of 3/4 by 3/4 by 3/8 inch dimensions ($\pm$ 1/16 inch in each dimension). The diced potatoes shall be blanched only to the extent necessary to prevent

discoloration and to remove excess air. The blanched potatoes shall be immediately cooled to the initial temperature of the cooling water and thoroughly drained. The cooled, drained potatoes shall be handled in a manner to prevent discoloration and filled into the tray pack within 4 hours after blanching.

3.3.1.2 Diced, dehydrofrozen potato preparation. Diced, dehydrofrozen potatoes shall not be blanched, but may be thawed/tempered in such a manner that will not cause further degradation of the texture and only to the extent necessary to accommodate the filling operation. The thawed/tempered shall be handled in such a manner to prevent discoloration.

3.3.2 Preparation of the sauce. The sauce shall be formulated and prepared as follows:

Ingredients	Percent by Weight 1/
Water	75.053
Margarine	15.000
Starch, waxy maize, modified	5.000
Salt 2/	2.500
Sugar, granulated	1.500
Flavoring, butter	0.300
Lecithin	0.250
Calcium chloride	0.200
Pepper, white, ground	0.150
Celery seed, ground	0.030
Calcium disodium EDTA	0.017

1/ Not more than 2.5 percent filling and processing aid starch may be used (see 3.2.14).

2/ The total amount of salt shall be adjusted, as necessary, to ensure compliance with the finished product salt requirements.

NOTE: The following sauce preparation procedures were used in the development of this product. Alternate procedures may be used provided finished product requirements are met. (When alternate procedures are used, the time and temperature requirements specified for the prepared sauce are still applicable).

a. A thin slurry shall be prepared using the starch and part of the water.

b. The remaining ingredients shall be combined and heated to 180^{o} to 190^{o}F.

c. The prepared slurry shall be added to the mixture and thoroughly mixed to form the sauce.

d. The sauce shall be heated to 180°F to 190°F and held in this temperature range for 5 minutes.

e. The volume of the sauce shall be adjusted with water prior to filling to compensate for evaporation loss during heating and holding.

f. The sauce shall be used within 4 hours after preparation. The prepared sauce shall be held in the temperature range of 150°F to 180°F at all times prior to filling into the tray pack cans or polymeric trays.

3.3.3 Product preparation. The blanched fresh potato dices and the sauce shall be combined in the following proportions:

Ingredients	Percent by Weight 1/
Potatoes, fresh, diced, blanched 2/	65.0
Sauce	35.0

1/ The percent by weight of ingredients may be adjusted, if necessary to ensure compliance with finished product drained weight requirements.

2/ When dehydrofrozen potatoes are used the percent potatoes used shall be 33.0 and the percent water shall be 32.0.

3.4 Tray pack can or polymeric tray filling and sealing. Each tray pack can (see 5.1.1) or polymeric tray (see 5.1.2) shall be filled with product such as to conform to the finished product requirements and to the following requirements.

a. For style a, immediately after filling, each can shall be sealed in accordance with the can manufactures guidelines/requirements and 21 CFR, Part 113, Subpart D, or CFR 9, Part 318, Subpart G, as applicable (see 4.5.5), and under a vacuum established by a processing authority and specified in the scheduled process so as to ensure compliance with finished product requirement (see 3.6.n). For style b, immediately after filling, each polymeric tray shall be hermetically sealed so as to ensure compliance with the requirements specified in MIL-PRF-32004 (see 4.5.5.1).

b. The filled and sealed tray pack cans or polymeric trays shall be in the retort process within 2 hours after sealing.

3.5 Tray pack thermoprocessing (style a only). The filled and sealed tray pack cans shall be thermostabilized by retorting until a sterilization value (F_o) of not less than 5.6 has been

achieved. The filled and sealed thermoprocessed tray pack cans shall show no evidence of can swelling when tested for commercial sterility as specified in 4.5.3.4.

3.5.1 Polymeric tray processing (style b only). The filled and sealed polymeric trays shall be processed until commercially sterile (see 4.5.3.4).

3.6 Finished product requirements. Unless otherwise specified, finished product for style a and b shall comply with the following requirements:

a. There shall be no foreign material such as, but not limited to, dirt, insect parts, hair, wood, glass, or metal.

b. There shall be no foreign odor or flavor such as, but not limited to, burnt, scorched, stale, sour, rancid, or moldy.

c. There shall be no color foreign to the product.

d. For style a, the average net weight shall be not less than 106 ounces. For style b, the average net weight shall be not less than 92 ounces.

e. For style a, no individual can shall contain less than 104 ounces of product. For style b, no individual polymeric tray shall contain less than 90 ounces of product.

f. For style a, no individual can shall contain less than 62.0 ounces of drained potato dices. For style b, no individual polymeric tray shall contain less than 52.0 ounces of drained potato dices.

g. For style a, the average drained weight of potato dices shall be not less than 66.0 ounces or more than 74.0 ounces. For style b, the average drained weight of potato dices shall be not less than 57.0 ounces or more than 65.0 ounces.

h. The salt content of any individual tray pack can or polymeric tray shall be not greater than 1.3 percent or less than 0.5 percent.

i. The potato dices shall be firm but not be mushy, hard, rubbery or fibrous.

j. The potatoes shall be distinct dices and have a white to off-white color.

k. The sauce shall be smooth, without lumps and shall not be excessively thick or thin.

l. The sauce shall be a pale off-white to yellow color.

m. Not less than 75 percent by weight of potato dices shall be intact dices.

n. The product shall show no evidence of excessive heating (materially darkened or scorched).

o. For style a, filled, sealed, and retorted cans shall show evidence of proper vacuum as determined by concavity of the can lid (see 4.5.6).

p. For style b, the packaged food shall meet the minimum shelf life requirement of 18 months at 80°F or 36 months at 80° F (see 4.5.3.5).

q. For style b, the filled, sealed and processed polymeric tray shall show evidence of proper residual gas volume and internal pressure (see 4.5.6.1).

3.6.1 Palatability. The finished product shall be equal to or better than the preproduction sample (6.1) in palatability and overall appearance.

3.7 Plant qualification. The product shall be prepared, processed, and packaged in establishments meeting the requirements of Title 21, Code of Federal Regulations, Part 110, "Current Good Manufacturing Practice in Manufacturing, Packing or Holding Human Food," and the plant sanitation requirements of the appropriate Government inspection agency.

3.8 Federal Food, Drug, and Cosmetic Act. All deliveries shall conform in every respect to the provisions of the Federal Food, Drug, and Cosmetic Act and regulations promulgated thereunder.

4. QUALITY ASSURANCE PROVISIONS

4.1 Contractor's responsibility. Inspection and acceptance by the USDA shall not relieve the contractor of obligation and responsibility to deliver a product complying with all requirements of this document. The contractor shall assure product compliance prior to submitting the product to the USDA for any inspection.

4.2 Inspection and certification. Product acceptability shall be determined by the USDA. The USDA will determine the degree of inspection necessary to ensure compliance with the requirements of this specification.

4.3 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.4)
b. Quality conformance inspection (see 4.5)

4.4 First article inspection. When a first article is required (see 6.1), it shall be inspected in accordance with the quality assurance provisions of this specification and evaluated for overall appearance and palatability. Any failure to conform to the quality assurance provisions of this specification or any appearance or palatability failure shall be cause for rejection of the first article.

4.5 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with ANSI/ASQC Z1.4-1993.

4.5.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.

4.5.1.2 Ingredient and component examination. Conformance of ingredients and components to identity, condition, and other requirements specified in 3.2 shall be certified by the ingredient supplier or ingredient manufacturer, and compliance be verified by examination of pertinent labels, markings, U.S. Grade Certificates, certificates of analyses, or other such valid documents acceptable to the inspection agency. If necessary, each ingredient shall be examined organoleptically or inspected according to generally recognized test methods, such as the standard methods described in the Official Methods of Analysis of the Association of Official Analytical Chemists and in the Approved Methods of the American Association of Cereal Chemists, to determine conformance to the requirements. Any nonconformance to an identity, condition, or other requirement shall be cause for rejection of the ingredient or component lot or of any involved product.

4.5.2 In-process examination. In-process examination shall be performed to determine conformance to the preparation, processing, can or polymeric tray interior coating, filling, sealing, and packing requirements. Any nonconformance revealed by actual examination or by review of records of time, temperature, and formulation or of other valid documents shall be cause for rejection of the involved product.

4.5.3 Tray pack can or polymeric tray inspection. The USDA reserves the right to separate the inspection lot into smaller inspection lots.

4.5.3.1 Net weight inspection. Randomly select 30 filled and sealed tray pack cans or 30 filled and sealed polymeric trays from the inspection lot and weigh separately. Subtract the average tare weight (determined by randomly selecting and weighing 30 of the empty tray pack cans and lids or 30 polymeric trays and lids used in preparing the product and dividing the total weight by 30) from the weight of each tray pack can or polymeric tray in the sample. The results shall be reported to the nearest 1 ounce. For style a, if the average net weight is less than 106 ounces or if

the net weight of any individual can is less than 104 ounces, the lot shall be rejected. For style b, if the average net weight is less than 92 ounces or if the net weight of any individual tray is less than 90 ounces, the lot shall be rejected.

4.5.3.2 Double sampling plan for product inspection. The finished product shall be examined for the defects listed in table I utilizing the double sampling plans indicated in ANSI/ASQC Z1.4-1993. The lot size shall be expressed in tray pack cans or polymeric trays. The inspection level shall be S-3 and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 4.0 for major defects. The sample cans or polymeric trays shall be heated in accordance with the heating instructions on the can label.

TABLE I. Product defects 1/ 2/

Category	Defect
Major	
101	For style a, the drained weight in a can is less than 62.0 ounces. For style b, the drained weight in a polymeric tray is less than 52.0 ounces. 3/ 4/
102	Potato dices hard, rubbery, fibrous or mushy
103	Potato dices not distinct dices
104	Potato dices not a white to off-white color
105	Sauce not smooth, without lumps or is excessively thick or thin
106	Sauce not a pale off-white to yellow color
107	Less than 75 percent by weight of potato dices are intact dices
108	Product shows evidence of excessive heating (materially darkened or scorched).

1/ The presence of foreign material (for example, glass, dirt, insect parts, hair, wood, metal) foreign odor or flavor (for example, burnt, scorched, stale, sour, rancid, moldy) or foreign color shall be cause for rejection of the lot.

2/ Product not equal to or better than the approved preproduction sample in palatability and overall appearance shall be cause for rejection of the lot (see 3.6.1).

3/ To determine washed drained weight, The contents of the tray pack can or polymeric tray shall be poured into a 12 inch diameter U.S. Standard 1/4 inch sieve in a manner that will distribute the product evenly in the sieve. The sieve and contents shall be immersed in 140°F to 160°F water, and the sieve shall be agitated with a vigorous swirling motion for 1 minute taking care to separate the product into individual dices. The sieve and contents shall be removed from the water and then reimmersed momentarily twice in succession. The sieve shall be tilted at approximately a 45^0 angle and allowed to drain 2 minutes before determining the drained weight by subtracting the sieve tare weight from the gross weight. The drained weight shall be reported to the nearest 0.1 ounce.

4/ For style a, the lot shall be rejected if the sample average drained weight of diced potatoes is less than 66.0 ounces or more than 74.0 ounces. For style b, the lot shall be rejected if the sample average drained weight of diced potatoes is less than 57.0 ounces or more than 65.0 ounces.

4.5.3.3 Salt content testing. Three filled and sealed tray pack cans or three filled and sealed polymeric trays shall be selected at random from the lot. The product shall be tested for salt in accordance with the Official Methods of Analysis of AOAC, method 935.47, except that preparation of the samples shall be as follows: The cans or polymeric trays shall be opened and the entire contents of each can or polymeric tray shall be separately blended in a Waring blender or equivalent. The test results shall be reported to the nearest 0.1 percent. Any result failing to conform to the requirements in 3.6 shall be classified as a major defect and shall be cause for rejection of the lot.

4.5.3.4 Commercial sterility testing. The sample size shall be one filled, sealed, and thermoprocessed tray pack can selected from each retort batch in the lot. The sample cans shall be tested for sterility by incubating the cans at 95^0F $\pm$ 5^0F for 10 days unless otherwise specified by the inspection agency. Any evidence of can swelling or microbial activity shall be classified as a critical defect and shall be cause for rejection of the lot.

4.5.3.5 Shelf life (Style b only).

4.5.3.5.1 Shelf life (18 months). Compliance with requirement shall be determined by incubation for 18 months at 80°F. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.3.5.2 Shelf life (36 months). Compliance with requirement shall be determined by incubation for 1 month at 120 or 6 months at 100°F or 36 months at 80°F. Following the incubation period, the contractor shall perform an organoleptic test comparing the incubated

samples to the control product. An acceptable product would receive a score of 5 or higher based on a hedonic scale. Contractor shall provide a certificate of conformance.

4.5.4 Can condition examination (style a only). Examination of filled and sealed tray pack cans shall be in accordance with the U.S. Standards for Condition of Food Containers, except that inspection for labeling shall be in accordance with 4.5.4.1. In addition, scratches, scuffs, or abrasions that occur on the outside coating as a result of the filling, sealing, and thermoprocessing of the tray cans shall not be scored as a defect.

4.5.4.1 Can label examination (style a only). Labels shall be examined for defects in accordance with MIL-L-1497 (see 5.4) except, for self-adhering labels, the following additional defects shall apply:

Major: Label torn or scratched so as to obliterate any of the markings.

Minor: Air bubbles under label.
Label not properly adhered to can, for example, label raised or peeled back from edges or corners.

4.5.4.2 Label adhesive examination (style a only). When self-adhering labels are used, the adhesive shall be tested in accordance with ASTM D 3330.

4.5.4.3 Polymeric tray condition examination (style b only). Examination of filled and sealed polymeric trays shall be in accordance with Table II or MIL-PRF-32004.

4.5.4.3.1 Polymeric tray label examination (style b only). Labels shall be examined in accordance with the Quality Assurance Provisions and Packaging Requirements of MIL-PRF-32004.

4.5.5 Can closure examination (style a only). Can closures shall be examined visually and by teardowns in accordance with the can manufacturer's guidelines/requirements and 21 CFR, Part 113, Subpart D, or 9 CFR, Part 318, Subpart G, as applicable. Any nonconformance based on observation of can seam teardowns or on record of can seam teardowns shall be classified as a major defect and shall be cause for rejection of any involved product.

4.5.5.1 Polymeric tray closure examination (style b only). Polymeric tray closure shall be examined in accordance with table II of MIL-PRF-32004.

4.5.6 Vacuum examination (style a only). Cans shall be allowed to cool to $70^0 \pm 5^0$F, held for at least 24 hours after sealing, and then examined for vacuum retention. To examine, lay a straight edge in the center of the lid along the length of the tray pack. Both ends of the straight edge shall

touch the lid at the inside edge of the double seam. There shall be a visible gap between the straight edge and the lid for the entire distance of the label panel. Using a shorter straight edge, the same procedure shall be used across the width, in the center of the tray pack can. One measurement shall be made when examining a ribbed lid, lay the straight edge only between the two center ribs along the length of the can. The inspection lot shall include only tray packs produced in a single shift on a single sealing machine. The sample size shall be 50 cans. Any nonconformance shall be classified as a major defect and shall be cause of rejection of the lot.

4.5.6.1 Polymeric tray testing (style b only). Polymeric trays shall be tested for conformance to residual gas volume and internal pressure requirements in accordance with MIL-PRF-32004.

4.5.7 Shipping container examination (style a and style b). The filled and sealed shipping containers examined for the defects listed below. The lot size shall be expressed in shipping containers. The sample unit shall be one shipping container fully packed. The inspection level shall be S-3 and AQL, expressed in terms of defects per hundred units, shall be 4.0 for major defects and 10.0 for total defects.

Major: National stock number, item description, contract number, or date of pack markings missing, incorrect, or illegible
Reinforced with other than nonmetallic strapping or tape
For style a only, dimensions of pads not as specified
For style a only, interior packing with fiberboard liner or pads not as specified
For style b only, protective sleeve missing

Minor: Other required markings missing, incorrect, or illegible
Arrangement or number of cans or polymeric trays not as specified

5.4.8 Unit load inspection (style a only). Inspection of unit loads shall be in accordance with the quality assurance provisions of DSCP FORM 3507.

4.5.8.1 Unit load inspection (style b only). The unit loads shall be examined in accordance with quality assurance provisions and packaging requirements of MIL-PRF-32004.

5. PACKAGING

5.1 Preservation. The product shall be preserved in accordance with level A.

5.1.1 Level A (style a only). One hundred and six ounces of food product shall be filled into a tray pack can conforming to MIL-C-44340 and sealed and thermoprocessed as specified in 3.4 and 3.5.

5.1.2 Level A (style b only). Ninety-six ounces of food product shall be filled into a polymeric tray conforming to MIL-PRF-32004 and sealed and processed as specified in 3.4 and 3.5.1.

5.2 Packing (style a only). The product shall be packed in accordance with Level A, B, or C as specified (see 6.1).

5.2.1 Level A packing. Four cans of product, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L or HSC-L with an HSC full depth cover, grade V2s of ASTM D 5118. The cans shall be packed flat, four in depth within the box, with the first two cans placed with the lids together and the next two cans with the lids together. The inside of each box shall be provided with a box liner and five fiberboard pads fabricated of grade V3c fiberboard. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box. Each box shall be reinforced with nonmetallic strapping or pressure-sensitive adhesion filament-reinforced tape in accordance with the appendix of ASTM D 1974. Shipping containers shall be arranged in unit loads in accordance with DSCP FORM 3507 for the type and class of load specified (see 6.1) except that the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern . Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.2.2 Level B packing. Four cans of product, preserved as specified in 5.1, shall be packed as specified in 5.2.1, except the box shall be constructed of grade V3c, V3s, or V4s fiberboard.

5.2.3 Level C packing. Four cans of product, preserved as specified in 5.1, shall be packed in a snug-fitting fiberboard box, constructed and closed in accordance with style RSC-L, class domestic, grade 275 of ASTM D 5118. The cans shall be packed flat, four in depth within the box, with the first two cans placed with the lids together and the next two cans with the lids together. The inside of each box shall be provided with a box liner and five fiberboard pads. The height of the box liner shall be equal to the full inside depth of the box (+0 inch, -1/8 inch). Flute direction of the box liner shall be vertical. The pads shall be placed between the cans and on the top and bottom of the stacked cans. The pad dimensions shall be not less than 1/8 inch of the full length and width dimensions of the box and shall be fabricated of the same material as the box.

5.2.4 Polymeric tray packing for shipment to ration assembler (style b only). Packing for shipment to ration assembler shall be in accordance with the quality assurance provisions and packaging requirements of MIL-PRF-32004.

5.3 Unit loading (style a only). When specified (see 6.1), the product, packed as specified in 5.2.2 or 5.2.3, shall be arranged in unit loads in accordance with DSCP FORM 3507 for the type and class of load specified, except that the unit load shall consist of 48 boxes with 12 boxes per course and four courses per load with all courses having the same pattern. Boxes may be stacked by interlocking and reversing each tier, or by columnar stacking with paperboard or fiberboard sheets placed between each tier. When unit loads are strapped, strapping shall be limited to nonmetallic strapping, except for type II, class F loads.

5.3.1 Unit loading (style b only). Unit loads shall be in accordance with the quality assurance provisions and packaging requirements of MIL-PRF-32004.

5.4 Labeling (style a only). Each tray pack can shall be labeled in accordance with MIL-L-1497 and with the following:

- Official establishment number (for example, EST 38) or a three letter code identifying the establishment
- Lot number 1/
- Product shift number 1/
- Retort identification number 1/
- Retort cook number 1/

1/ The lot number shall be expressed as a four-digit Julian code. The first digit shall indicate the year of production and the next three digits shall indicate the day of the year (Example, September 13, 1993 would be coded as 3256). The Julian code shall represent the day the product was
packaged and processed. Sub-lotting (when used) shall be represented by an alpha character immediately following the four-digit Julian code. Following the four-digit Julian code and the alpha character (when used), the other required code information shall be printed in the sequence as listed above.

In addition, the name of the product shall be marked, stamping is permitted, on one 1001 by 200 side of the can. The labeling shall be legible when examined as specified in 4.5.4 after preparation of product in accordance with heating instructions. Paper labels are not permitted. Cans shall show the following statements:

TO HEAT IN WATER: Submerge unopened can in boiling water. Simmer gently 40-45 minutes. Avoid overheating (can shows evidence of bulging).

CAUTION: Use care when opening as pressure may have been generated within the can.

TO HEAT IN OVEN: Either punch several holes in lid of can or open can in usual manner leaving the loose lid in place. Place in a 350°F oven 35-40 minutes.

WARNING: Do not place unopened can in oven. This may cause the can to burst.

YIELD: Serves 18 portions of 2/3 cup each.

As an alternate labeling method, a printed self-adhering, 0.002-inch thick, clear polyester label printed with indelible black ink may be used. Self-adhering labels shall be applied after retorting. Pressure-sensitive adhesive shall require no preparation prior to application. Labels shall tack quickly and adhere without curling or breaking. The adhesive shall have a minimum adhesion of 60 ounces per inch width when examined as specified in 4.5.4.2. When self-adhering label is used, the tray pack cans shall be labeled with the Julian code and a product code prior to retorting.

5.4.1 Labeling (Style b only).

5.4.1.1. Tray. Each polymeric tray shall be labeled in accordance with the Quality Assurance Provisions and Packaging Requirements for MIL-PRF-32004.

The tray lid shall show the following statements:

TO HEAT IN WATER: Submerge unopened tray in boiling water. Simmer gently 40-45 , minutes. Avoid overheating (tray shows evidence of bulging).

WARNING: Do not heat tray in oven.

TO TRANSPORT AFTER HEATING: Insert tray back into protective sleeve to protect during transport. If sleeve is unavailable, stack trays lid-to-lid with fiberboard pads in between.

CAUTION: Use care when opening as pressure may have been generated within the tray.

TO OPEN: Using a clean knife, cut the lidding around the inside perimeter of the tray seals.

SUGGESTION: Cut lid along 3 sides and fold over uncut portion. Fold back to keep unused portions protected.

YIELD: Serves 18 portions of approximately 2/3 cup each.

5.5 Marking (style a only).

5.5.1 Shipping containers. In addition to any special marking required by the contract or purchase order, shipping containers shall be marked in accordance with DPSC FORM 3556.

5.5.2 Unit loads. Unit loads shall be marked in accordance with DSCP Form 3556. In addition, the following precautionary marking in capital letters larger than other markings shall be included:

5.6 Marking (style b only). Marking of shipping containers and unit loads shall be in accordance with the quality assurance provisions and packaging requirements of MIL-PRF-32004.

CAUTION: DO NOT STACK PALLETS IN TRANSIT OR MORE THAN TWO HIGH IN STORAGE UNLESS PALLET RACKS ARE USED.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory).

6.1 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
c. When a first article is required (see 3.1, 4.4, and 6.2).
d. Provisions for approved preproduction samples (see 3.6.1 and 6.2).
e. Level of packing required (see 5.2).
f. Type and class of unit load when unit loading is required (see 5.2.1 and 5.3).
g. Style required (see 1.2).

6.2 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.

6.3 Appropriate level of pack. Based on conditions known or expected to be encountered during shipment, handling, and storage of the specific item being procured, the procuring activity should select the appropriate level of pack in accordance with the criteria established in AR 700-15/NAVSUPINST 4030.28/AFR 71-6/MCO 4030.33A/DLAR 4145.7.

6.4 Natural butter flavor. It has been found that natural butter flavor WONF NAT 474130 and natural butter flavor FL#094676 manufactured by F & C International, Inc., 890 Renda Terrace, Cincinnatti, Ohio 45215 perform satisfactorily in this product and meet the requirements of paragraph 3.2.10.

6.5 Starch, filling and processing aid. It has been found that National 150 produced by National Starch and Chemical Corporation, meets the requirements of 3.2.14 and performs satisfactorily in this product.

6.6 Subject term (key word) listing.

Canned foods
Combat field feeding
Ration
Shelf stable

Custodians:

Army - GL
Navy - SA
Air Force - 50

Preparing activity:

Army - GL

(Project 8940-0671)

Review activities:

Army - MD, QM
Navy - MC
DP - SS

Notes:

1. 5-18-99 Changes made to addresses and DSCP FORM 3507.